



Lincoln University

DI 115 – ECG and Arrhythmias Interpretation

COURSE SYLLABUS Summer 2019

- Instructor:** Chris T. Nguyen, Ph. D. (*)
Lecture Schedule: Tuesday, 12:30 PM – 4:30 PM Lectures
Wednesday, 3:30 PM – 7:30 PM Lab
- Credits:** 3 units / 30 hours of lectures + 30 hours of Lab
Level: Advanced (A)
Office Hours: By appointment
e-mail: nguyen@lincolnuca.edu, or chinguyen39@gmail.com
Home Phone: 510-489-8727
Cell. Phone: 498-439-3448
- Textbooks and Resource Materials:** **Clinical Electrocardiography** by Ary L. Goldberger, MD, Mosby Publishing,
8th edition (2012), ISBN-10: **0323087868**, ISBN-13: **978-0323087865**
7th edition, ISBN-10: **0323040381**, ISBN-13: **978-0323040389**
- 12-Lead EKG Confidence** by Jacqueline M. Green, Anthony J. Chiaramida, MD, Springer Publishing, 2nd edition (2009), ISBN-10: **082610472X**, ISBN-13: **978-0826104724**
- ECGs Made Easy** by Barbara Aehlert, Mosby Publishing, 4th edition (2009), ISBN-10: **032306924X**, ISBN-13: **978-0323069243**
- EKG and Heart Murmurs** by Peter Q. Warinner, MD, Wysteria Publishing, ISBN-10: **1932412026**, ISBN-13: **978-1932412024**
- <http://www.cardiaceps.org/>
- Prerequisite:** *DI 30 or equivalent*
Last Revision: May, 2019

CATALOG DESCRIPTION

Students will learn the principles and procedures of 12-lead electrocardiography (ECG), arrhythmia interpretation and care, maintenance of equipment and exam area. (3 units)
Prerequisite: DI 30 / UT 30 or equivalent

COURSE DESCRIPTION

This course introduces Electrocardiography principles and instrumentation. Topics include Basic ECG waves, Normal ECG, Abnormal ECG, Arrhythmias, ECG interpretation. Related topics such as Patient preparation, Safety, Quality, Accuracy, and ECG Reporting are also covered.

EDUCATIONAL OBJECTIVES AND STUDENT LEARNING OUTCOMES

Upon satisfactory completion of this Course, the students will be able to:

- Understand ECG principles and instrumentation
- Understand the Basic ECG waves, ECG leads, Normal ECG and Abnormal ECG
- Understand, Read and Interpret the following items: Electrical Axis, Axis Deviation, Atrial and Ventricular Enlargement, Ventricular Conduction Disturbances, Myocardial Ischemia and Infarction, Electrolyte Abnormalities and Metabolic Factors, Pericardial, Myocardial and Pulmonary Syndromes, Wolf-Parkinson-White Pre-excitation Patterns, Sinus Rhythm, Tachycardias and Bradycardias, Supraventricular Arrhythmias, Atrioventricular Heart Block, Cardiac Arrest and Sudden Death, Pacemakers and Implantable Cardioverter-Defibrillators, etc.
- Take and interpret an ECG
- Understand and use of Differential Diagnosis
- Understand the uses and limitations of ECG

COURSE LEARNING OUTCOMES¹

	Course LO	Program LO	Institutional LO	Assessment activities
1	Understand the anatomy and physiology of the cardiovascular system and the cardiac conduction system.	PLO 1	ILO 1a, ILO 2a, ILO 3a	In-class activities
2	Identify the parts of the electrocardiography wave forms and correlate each with the cardiac cycle. Calculate heart rate and complete measurements of all waveforms and intervals. Describe the electrocardiographic characteristics of a normal ECG pattern and those associated with cardiac arrhythmias including sinus, atrial, junctional and ventricular arrhythmias.	PLO 2	ILO 1a,	In-class activities, lab activities, quizzes
3	Demonstrate the correct placement of ECG electrodes on a patient. Demonstrate the proper use of single channel and three channel ECG machines and apply the appropriate test functions. Measure ECG waveforms and intervals,	PLO 2	ILO 1a	In-class activities, lab activities, quizzes, midterm and final exams

¹ Detailed description of learning outcomes and information about the assessment procedure are available at the [Center for Teaching and Learning](http://ctl.lincolnuca.edu) website (ctl.lincolnuca.edu).

	determine heart rate, rhythm, and complete a preliminary assessment of findings. Summarize the steps used to perform an exercise stress test on a patient. Explain the steps used to perform a blood pressure.			
4	Describe the cardiac pathophysiology associated with advanced cardiovascular system disorders. Identify the electrocardiographic findings associated with cardiac ischemia and myocardial infarction.	PLO 1	ILO 1a, ILO 2a, ILO 3a	In-class activities, quizzes, midterm and final exams
5	Demonstrate the steps used to perform a blood pressure on a resting patient and during an exercise stress test. Describe the indications for a 24 Hour Holter Monitor. Demonstrate the successful application of Holter Monitor device. Summarize the steps used to safely perform an exercise stress test. Demonstrate the procedure for performing an exercise stress test, utilizing the computer instrumentation for monitoring the ECG during the procedure, obtaining blood pressures and observing safety conditions for patient.	PLO 2 PLO 3	ILO 1a, ILO 4a	In-class activities, lab activities, quizzes, midterm and final exams
6	Explain the electrocardiographic findings of heart block, bundle branch blocks, accessory pathways, electrical axis, hypertrophy, and chamber enlargement. Identify the electrocardiographic findings associated with cardiac ischemia and myocardial infarction.	PLO 3	ILO 1a, ILO 4a	In-class activities, quizzes, midterm and final exams, case studies
7	Describe ECG findings related to cardiac medications. Explain the indications and test procedures of pharmacologic stress testing. Describe the technology of cardiac pacemakers and implantable defibrillators and the ECG findings associated with each.	PLO 4	ILO 2a, ILO 7a	Case studies, in-class activities, quizzes

INSTRUCTIONAL METHODS

Instructional methods will include Instructor lectures and educational material presentations. Classroom activities are collective – students may and should help each other. The Instructors will be available to help students with all tutorials, assignments, and Lab practices. Students are expected to attend 30 hours of Lectures and 30 hours of Lab.

Assignments and projects require students to actively use resources of the library.

Detailed guide to business *resources of the library* as well as the description of Lincoln University approach to *information literacy* are available at the [Center for Teaching and Learning](http://ctl.lincolnuca.edu) website (ctl.lincolnuca.edu).

EVALUATION AND GRADING

Evaluation is based on attendance, lab participation, quizzes, midterm and final exams. To successfully complete this Course, the student must attend regularly the Lectures, pass the Quiz, Homework, Lab Practice, Mid-Term Exam and Final Exam portions with a total score of 70% or higher.

After successfully completed the Course, the students are strongly encouraged to take the Board Test to be certified. Results of the Board Test are gauged as students' learning results and achievement.

1. Weekly Homework and Quiz: Written homework assignments will be given, and additionally unannounced Review Quizzes will be given during class time.
2. Lab. Practice
3. Mid-Term Exam and Final Exam.

All activities will be graded according to the points as shown below.

Grade	A	B	C	D	F
Points	90-100	80-89	70-79	60-69	0-59

The final grade for the course will be given as the total weighted score for all activities according to the percentage shown in the table below.

Activity	Percent
Class Attendance	10%
Homework	10%
Quizzes	10%
Lab. Practice	30%
Midterm Exam	10%
Final Exam	30%
Total	100%

LECTURE SCHEDULE

Date	Topic
11-June	Introductory Principles; Basic ECG Waves. ECG Leads; The Normal ECG.
18-June	Electrical Axis, Axis Deviations; Atrial & Ventricular Enlargement. Ventricular Conduction Disturbances; Myocardial Ischemia & Infact.
25-June	Myocardial Ischemia & Infarction (Continued). Drugs Effects, Electrolyte Anomalies, Metabolic Factors. Pericardial, Myocardial & Pulmonary Syndromes. REVIEW.
2-July	MID-TERM EXAM. Wolff-Parkinson-White Pre-excitations Patterns.
9-July	Sinus Rhythm. Supraventricular Arrhythmias. Supraventricular & Ventricular Arrhythmias (Continued). Atrioventricular Heart Block
16-July	Digitalis Toxicity, Cardiac Arrest, Sudden Cardiac Death. Bradycardia & Tachycardia. Differential Diagnosis. REVIEW
23-July	FINAL. Certification Tests.

(*) INSTRUCTOR AFFILIATIONS

- A Reviewer for the Journal “Ultrasound in Medicine” since 2010
- A Reviewer for the Journal “Ultrasound in Medicine and Biology” since 2006 (have reviewed more than 80 Manuscripts).
- An Advisory Editorial Board Member of the Journal “Ultrasound in Medicine and Biology” since 2012

TEACHING/LEARNING FEEDBACK: Result of the actual **ARDMS Physics Test** (120 Questions / 2 hours) by the Students is gauged as teaching / learning feedback.